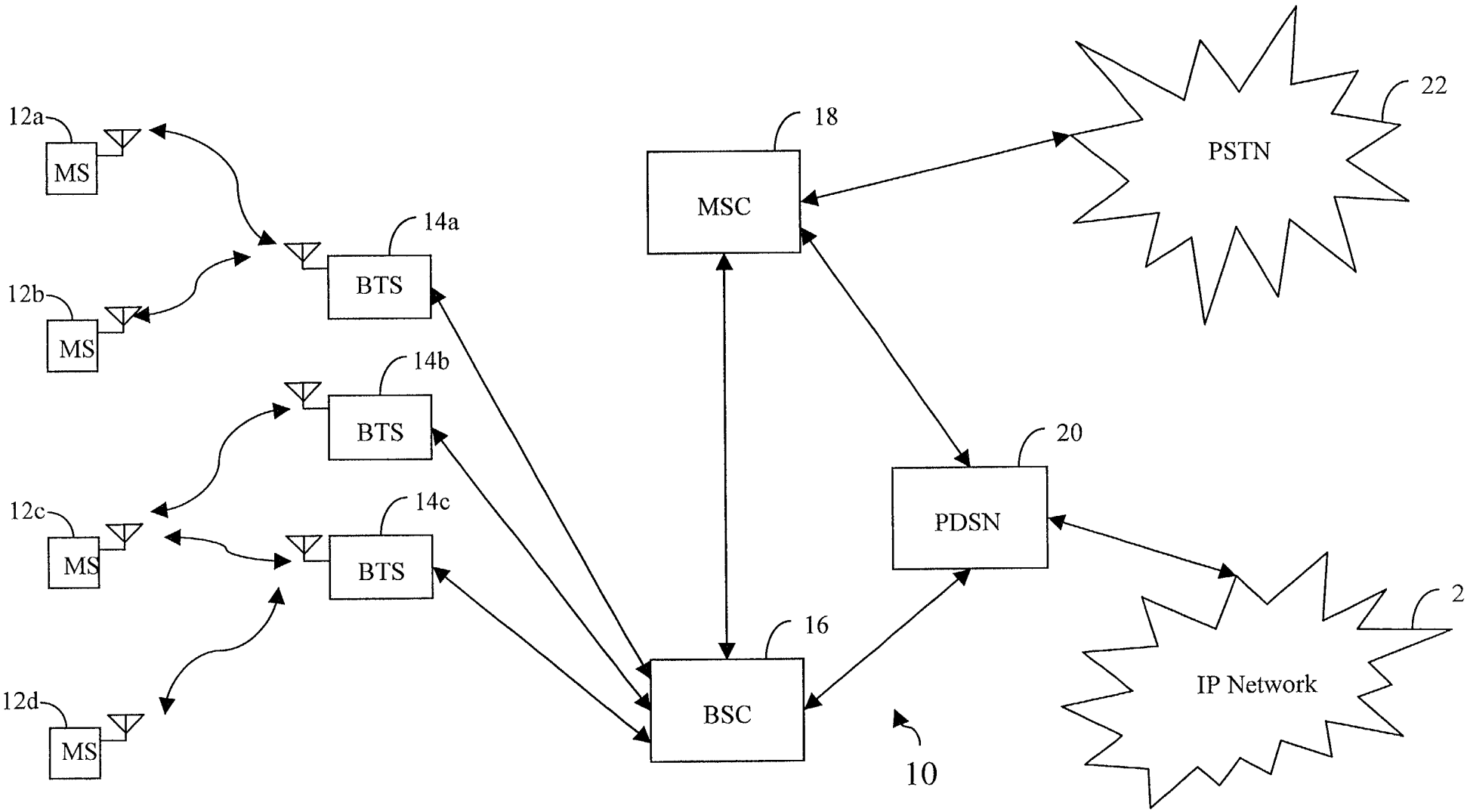
12a
MS
12b
MS
12c
MS
12d
MS
14a
BTS
14b
BTS
14c
BTS
18
MSC
22
PSTN
20
PDSN
16
BSC
2
IP Network
10

FIG. 1

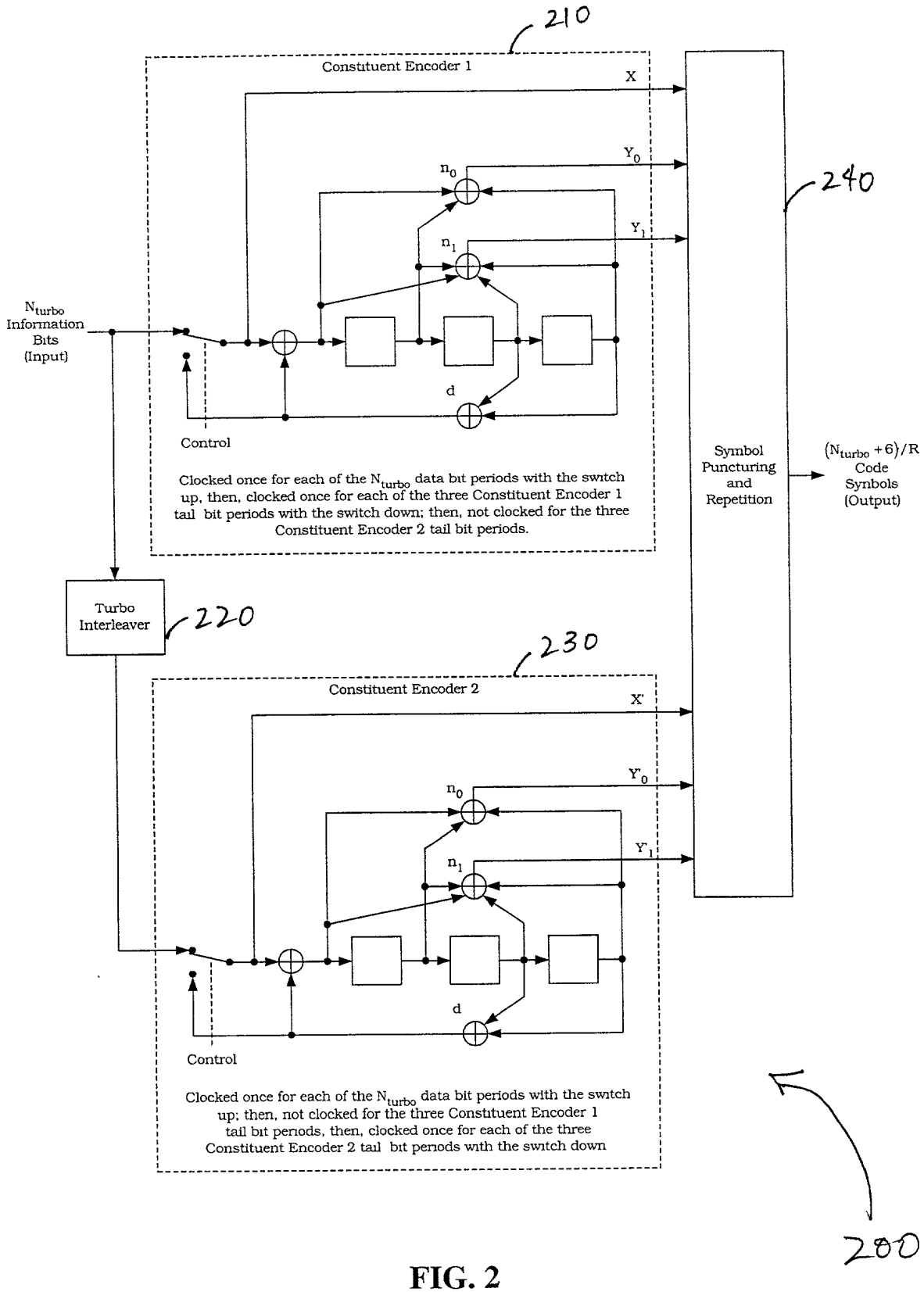
210
Constituent Encoder 1
X
Y_0
n_0
240
Y_1
n_1
N_{turbo} Information Bits (Input)
d
Control
Clocked once for each of the N_{turbo} data bit periods with the switch up, then, clocked once for each of the three Constituent Encoder 1 tail bit periods with the switch down; then, not clocked for the three Constituent Encoder 2 tail bit periods.
Symbol Puncturing and Repetition
$(N_{turbo}+6)/R$ Code Symbols (Output)
Turbo Interleaver
220
230
Constituent Encoder 2
X'
Y'_0
n_0
Y'_1
n_1
d
Control
Clocked once for each of the N_{turbo} data bit periods with the switch up; then, not clocked for the three Constituent Encoder 1 tail bit periods, then, clocked once for each of the three Constituent Encoder 2 tail bit periods with the switch down
200

FIG. 2

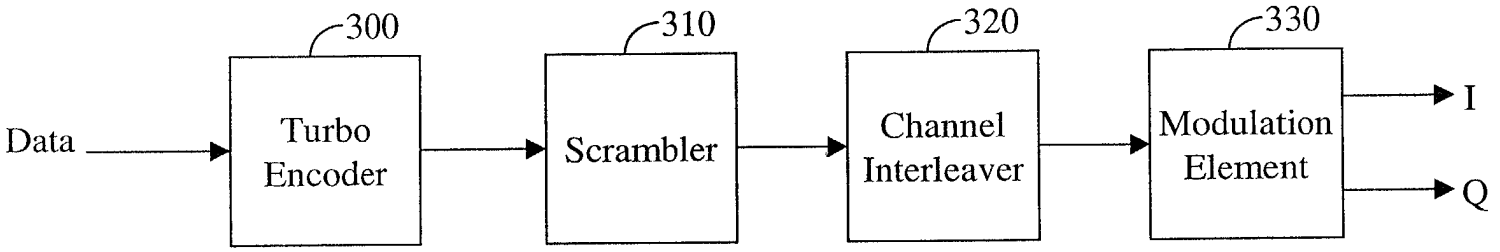
300
310
320
330
Data
Turbo Encoder
Scrambler
Channel Interleaver
Modulation Element
I
Q

FIG. 3

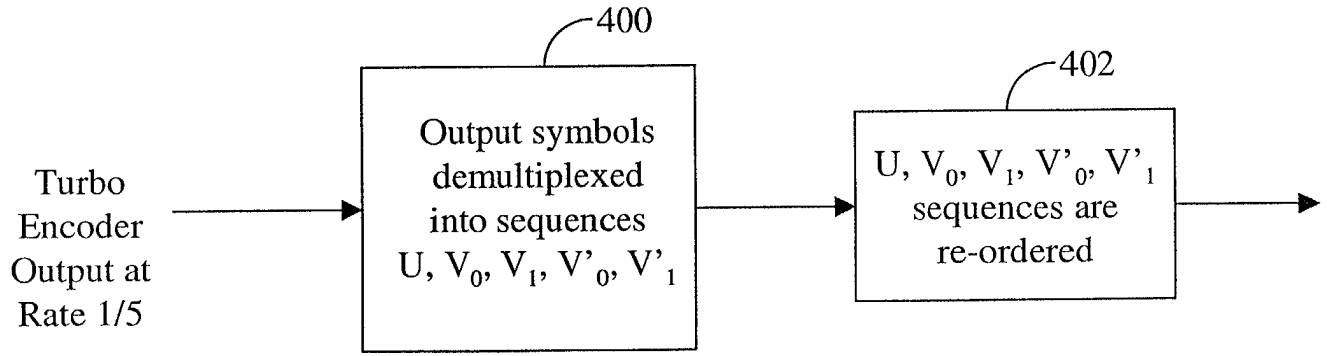
400
402
Turbo Encoder Output at Rate 1/5
Output symbols demultiplexed into sequences U, V_0, V_1, V'_0, V'_1
U, V_0, V_1, V'_0, V'_1 sequences are re-ordered

FIG. 4

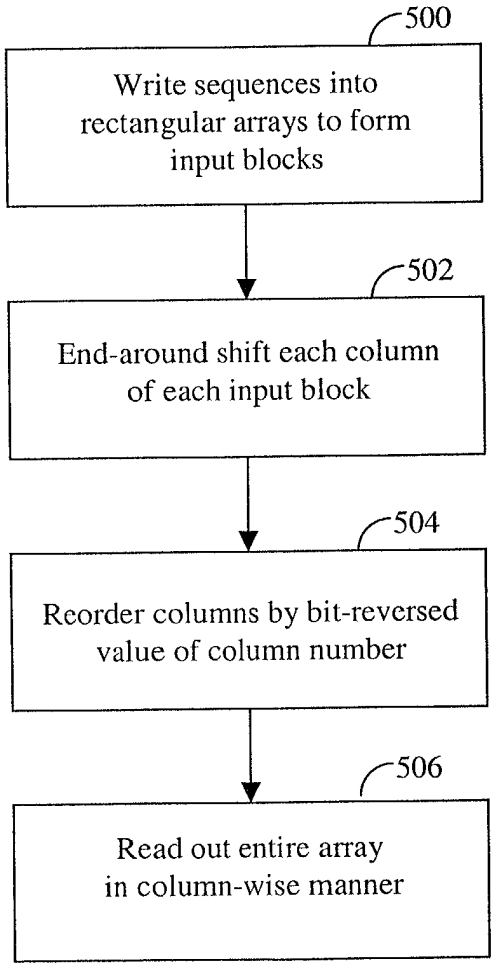
500
Write sequences into rectangular arrays to form input blocks
502
End-around shift each column of each input block
504
Reorder columns by bit-reversed value of column number
506
Read out entire array in column-wise manner

FIG. 5

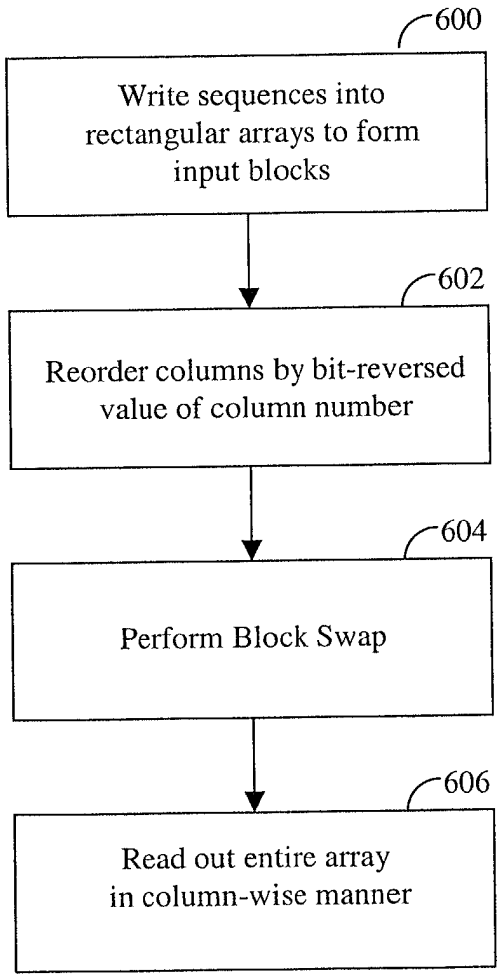
600
Write sequences into rectangular arrays to form input blocks
602
Reorder columns by bit-reversed value of column number
604
Perform Block Swap
606
Read out entire array in column-wise manner

FIG. 6

U block

	3’		4’
1		2	
3		4	

V_0/V'_0 block

1’	2’	5		6		7	8
		5’				7’	
				6’			8’

FIG. 7A: Block swap pattern for 8-PSK

U block

	3’
1	
	2
3	

V_0/V'_0 block

1’			6
	4		6’
	4’	5	
2’		5’	

FIG. 7B: Block swap pattern for 16-QAM

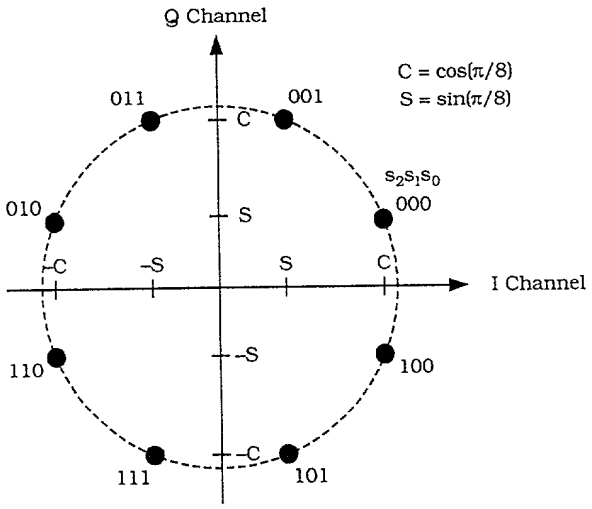
Q Channel
C = cos(π/8)
S = sin(π/8)
011
001
C
$s_2s_1s_0$
010
000
S
-C
-S
S
C
I Channel
-S
110
100
-C
111
101

FIG. 8

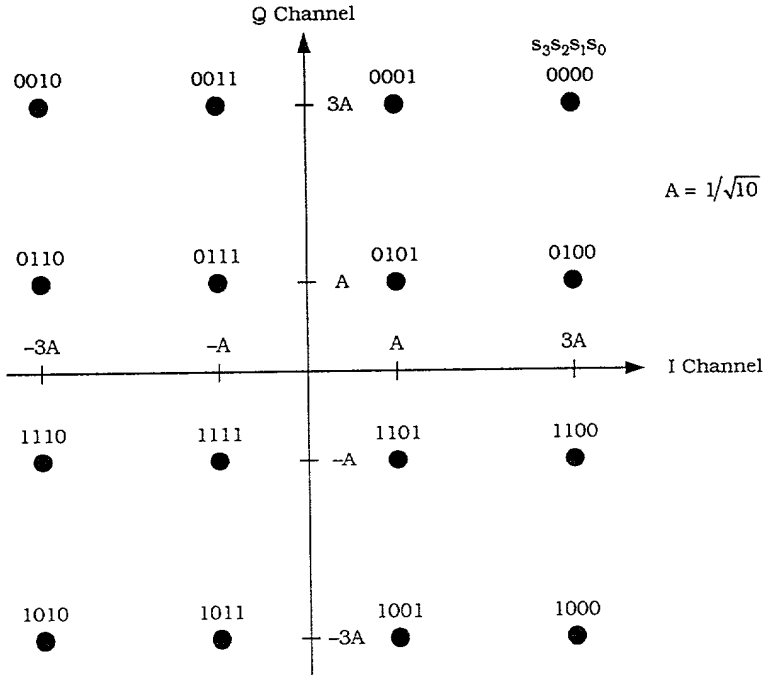
Q Channel
$s_3s_2s_1s_0$
0010
0011
0001
0000
3A
A = $1/\sqrt{10}$
0110
0111
0101
0100
A
-3A
-A
A
3A
I Channel
1110
1111
1101
1100
-A
1010
1011
1001
1000
-3A

FIG. 9